REMARKS/ARGUMENTS

Claim Objections

Claims 16-20 are objected to on the basis that there is no claim 15 for claims 16 to 20 to depend from and that there is no antecedent basis for the wording "step of calibrating the output driver." Applicants respectfully submit that claim 15, as amended above, is pending in the application and includes antecedent basis for the wording "step of calibrating the output driver." Claim 15 was filed in the original application and has not been canceled.

In Applicants' response filed on September 18, 2002 original claims 1-14 and 16-20 were amended and claims 21-23 were added under the old amendment format (e.g., where a clean copy of the amended claims was included in the response and a corresponding marked up copy of the amended claims was included in an Appendix to the response). In Applicants' response filed on June 4, 2003, claims 1 and 11 were again amended under the old amendment format. Claim 15 of the original application has not been canceled and has not been amended prior to the present response. Therefore, claim 15, as amended above, is pending in the application. The amendments to claim 15 above are merely directed to matters of form in order to more clearly set forth the elements of that claim. It is respectfully requested that the objection to claims 16-20 be withdrawn.

Claim Rejections – 35 U.S.C. § 102

Claims 1-4 and 7 are rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent 5,812,572 to King et al. (hereafter "King"). This rejection is respectfully traversed.

Claim 1 recites:

> A method for improving resolution of a current mode driver, where the current mode driver is operable to provide an output that falls within a predetermined range, the method comprising the steps of:
>
> sensing at least one of a process condition, a voltage condition and a temperature condition with a PVT detector;
>
> adjusting a full scale current of a DAC in accordance with an output of the PVT detector; and
>
> setting a current control signal based on an output of the DAC, the current control signal being applied to the current mode driver to improve resolution of the current mode driver.

Claim 1 is directed to a method for improving resolution of a current mode driver. King is related to fiber optic systems that include laser diodes. It is respectfully submitted that claim 1 is not anticipated by King as that patent does not disclose or describe each and every element of claim 1.

The method of claim 1 includes applying a current control signal to a current mode driver to improve resolution of the current mode driver. Current mode drivers are generally high speed drivers that may be used, for example, to drive signals onto a high-speed data bus. One common application for such drivers is in memory subsystems that may be included in computing systems, such as personal computers. Such an approach is discussed in the present application on page 3, lines 5-10, which recites:

> While many prior buses were driven by voltage level signals, it has become advantageous to provide buses that are driven by a current mode output driver. A benefit associated with a current mode driver is a reduction of peak switching current. In particular, the current mode driver draws a known current regardless of load and operating conditions. A further benefit is that the current mode driver typically suppresses noise coupled from power and ground supplies.

In the Office Action, it is asserted that a laser diode 24 (Fig. 1 of King) discloses a current mode driver. Applicants respectfully disagree with this assertion. Those of skill working in this area will appreciate that a diode (laser or other type) does not operate as a current mode driver. For instance,

a diode would not be used to drive a high speed bus. Diodes generally operate so as to restrict current flow in a circuit to a single direction. Furthermore, as is known, diodes do not provide any signal gain, as is desirable for a device that is used to drive a high-speed data bus.

Furthermore, the voltage-current characteristics of diodes are not consistent with those of current mode drivers. As noted above, an advantage of current mode drivers is that they draw a known (substantially constant) current regardless of load or operating conditions. In contrast, the current drawn by a diode is highly dependent on load and operating conditions. For instance, once the voltage applied across a diode exceeds the diode's threshold voltage, the current drawn by the diode increases exponentially. This is not the case with a current mode driver, which draws a substantially constant current across a range of operating voltages.

Furthermore, even assuming, merely for the sake of legal argument, that the laser diode 36 in King discloses a current mode driver, Claim 1 also recites adjusting a full scale current of a DAC (digital-to-analog converter) in accordance with an output of a PVT (process, voltage and temperature) detector and setting a current control signal based on an output of the DAC. In comparison, for the circuit disclosed in King, an output of a DAC 24 (under the control of a microcontroller 50) is used to generate and directly supply a modulation current that is conducted by the laser diode 36.

In the context of a current mode driver, a current control signal is a signal or signals (e.g., a digital signal or set of digital signals) that is/are applied to an output driver to adjust the operation of the current mode driver. (*See* Figure 10 and associated disclosure on page 25, line 20 through page 27, line 11). A current control signal, in the context of a current mode driver, is not a signal that generates a current that is then directly conducted by the current mode driver as is the case with

the output of the DAC 24 in King which generates a modulation current that is conducted by the laser diode 36. (*See* Fig 9 and associated text) Thus, the output signal of the DAC 24 in King is not used as the basis of a current control signal that is applied to a current mode driver as is recited in claim 1. The output signal of the DAC 24 in King is not a current control signal at all, but rather is a signal used to generate a current that is directly conducted by the laser diode 36. Thus, claim 1 further distinguishes from King in this respect.

Moreover, as noted above, the output of the DAC 24 in King is used to generate and directly supply a modulation current that is conducted by the laser diode 36. King says nothing about using this signal to affect the "resolution" of the laser diode 36. In contrast, the claimed invention recites "setting a current control signal based on an output of the DAC, the current control signal being applied to the current mode driver to improve *resolution of the current mode driver*." Based on the foregoing, King does not anticipate claim 1 as that patent fails to disclose each and every element of that claim. Therefore, the rejection of claim 1 should be withdrawn.

Claims 2-4 and 7 depend ultimately from claim 1 and include all the limitations of that claim and any intervening claims. Thus, without addressing the remarks with respect to claims 2-4 and 7 in the Office Action, which are not conceded, Applicants respectfully submit that claims 2-4 and 7 are patentable over King on the same basis as claim 1. Therefore, the rejection of claims 2-4 and 7 should be withdrawn.

Claim Rejections – 35 U.S.C. § 103

Claims 5 and 6 are rejected under 35 U.S.C. § 103(a) as being obvious over King in view of U.S. Patent 5,604,468 to Gillig. Gillig is directed to a temperature compensated frequency synthesizer (oscillator).

Without addressing the merits of the remarks made with respect to claims 5 and 6, it is noted that these claims depend from claim 1 and include all of its limitations. Because claim 1 is not obvious over King and Gillig, claims 5 and 6 are also not obvious over that combination by virtue of claim dependency.

As was discussed above, King fails to disclose or describe generating a current control signal based on the output of a DAC and also fails to disclose or describe applying such a current control signal to a current mode driver, as is also recited in claim 1. Gillig, which discloses an oscillator circuit, fails to make up for the deficiencies of King described above. Therefore, were one of skill in this area to combine King and Gillig, which it is not conceded that he or she would, that combination would still not produce the invention as recited in claim 1 as the combination would be lacking at least the aspects of claim 1 that were previously discussed. Therefore, claim 1 is not obvious over King in view of Gillig and, accordingly, claims 5 and 6 are not obvious by virtue of their dependency on claim 1. Thus, the rejection should be withdrawn.

Claims 9 and 10 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over King as applied to claim 1. Without addressing the merits of the remarks made with respect to claims 9 and 10, it is noted that these claims both depend from claim 1 and include all of its limitations. Because claim 1 is not obvious over King, claims 9 and 10 are also not obvious over that combination by virtue of claim dependency.

As was discussed above, King fails to disclose or describe generating a current control signal based on the output of a DAC and also fails to disclose or describe applying such a current control signal to a current mode driver, as is also recited in claim 1. Therefore, were one of skill in this area to have the King patent before him or her, he or she would not be able produce the invention as recited in claim 1 as these aspects of claim 1 (as discussed above) would be lacking. Therefore, claim 1 is not obvious over King and, accordingly, claims 9 and 10 are not obvious by virtue of their dependency on claim 1, and the rejection should be withdrawn.

Claims 21-23 are rejected under 35 U.S.C. § 103(a) as being obvious over King in view of U.S. Patent 6,308049 to Bellaouar et al. (hereafter "Bellaouar"). Bellaouar is directed to a fractional compensation timing circuit for tracking a voltage controlled oscillator output frequency.

Without addressing the merits of the remarks made with respect to claims 21-23, which are not conceded, it is noted that these claims both depend ultimately from claim 1 and include all of its limitations and the limitations of any intervening claims. Because claim 1 is not obvious over King and Bellaouar, claims 21-23 are also not obvious over that combination by virtue of claim dependency.

As was discussed above, King fails to disclose or describe generating a current control signal based on the output of a DAC and also fails to disclose or describe applying such a current control signal to a current mode driver, as is also recited in claim 1. Bellaouar, which discloses a frequency tracking circuit, fails to make up for the deficiencies of King described above. Therefore, were one of skill in this area to combine King and Bellaouar, which it is not conceded that he or she would, that combination would still not produce the invention as recited in claim 1 as the

combination would be lacking at least the aspects of claim 1 that were previously discussed. Therefore, claim 1 is not obvious over King in view of Bellaouar and, accordingly, claims 21-23 are not obvious by virtue of their dependency on claim 1. Thus, the rejection should be withdrawn.

Allowable Subject Matter

Applicants thank the Examiner for the indication of allowability of claims 11-14 and the further indication that claim 8 would be allowable if rewritten in independent form. Applicants, however, have elected to submit the foregoing arguments in favor or patentability of all claims.

Conclusion

In view of the foregoing, it is believed that all of the claims pending in this application are in condition for allowance. If the Examiner has any questions that may be resolved by telephone, he is invited to contact the undersigned at (360) 379-6514.

Respectfully Submitted,

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Date: Aug. 5, 2005

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